ELECTRONIC BOOK

BACKGROUND OF THE INVENTION

This invention relates to digital data readers and electronic books that emulate the attributes of a printed book, and more particularly, to electronic books that present to the reader the tactile feel, visual appearance, and general physical experience of reading a book that approximate that of a printed book.

Personal, hand-held digital data readers are known. Some have been devised as electronic books to function as substitutes for the printed book. These readers have attributes of a computer appliance. Known readers sometimes have a single display screen, but others may have two screens that substitute for the facing pages of a book. For example, U.S. Pat. No. 5,761,485 to Munyan discloses a personal electronic book system having a hinged electronic book with two touch-screen displays with touch control areas throughout the surfaces of the screens to control the display of information.

None of the known devices has found acceptance by book readers as a substitute for the printed book for use in common reading conditions, and in particular, none has been accepted as a book to curl up with, as the term is used by book readers.

It therefore would be desirable to have a digital data reader in the form of an electronic book that presents the reader with a reading experience that approximates that of reading a printed book.

SUMMARY OF THE INVENTION

According to the invention, a hand-held digital data reader, also termed an electronic book, is provided, and has visual, tactile, and operational attributes emulating the attributes of a printed book. Two displays are mounted in two hinged housings so as to open and close relative to each other, and present the reader with the effect of facing pages of a printed book. The screens display text and other material in the still position for reading, and also display the effect of turning pages and of leafing through pages at various speeds as controlled by the reader. When in the open position, the book may be held in one hand or in two hands with the hands and thumbs positioned in the positions commonly used by readers of printed books. The book is also operated with the hands substantially in the same positions. The displays are framed in the housings between a free end and hinged spine end. Each free end is formed as a thumb pad tapered in the manner of the tapered page edges of a printed book, so that when the book is open the thumb pads taper outwardly and rearwardly. The pads serve as resting places for the thumbs when held in the normal position for reading a book, and they also house the controls for controlling the presentation of material to the reader. The opposite spine end of the housing are rounded to simulate the rounded appearance of printed pages of an open book. In order to maintain the simulated appearance of the printed pages, the hinge structure connecting the left and right housings are constructed with a traveling pivot point so that the surfaces of the spine ends will maintain contact throughout the opening and closing of the book. The arrangement, dimensions and configuration of the parts of the book, the selection of materials, and the operational characteristics for controlling the presentation of reading material, all present to the book reader a close simulation of the experience of reading a printed book. The invention provides to the book lover and pleasure reader a substitute for the printed book that eliminates characteristics of known electronic readers which have rendered them unacceptable.

A desireable attribute of the printed book is that the reader always knows how much of the book has been read relative to that still to be read. Another embodiment of the invention adds an indicator of amount read, simulating the indication provided by the position of pages of the book. The indicator is presented as a part of the thumb pad so as not to appear on the same display as the material to be read.

The invention and objects and features of the invention will be more readily apparent from the following description and appended claims and drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a pictorial view of the electronic book as positioned for use by a reclining reader;

FIGS. **2**(*a*), **2**(*b*), and **2**(*c*) are pictorial views of the electronic book, respectively showing the positions of the hands and thumbs of the reader, when reading while holding the book with two hands, when reading while holding the book with one hand, and when turning a page;

FIG. **3** illustrates the electronic book in the open position;

FIG. **4** is a diagram illustrating the traveling hinge pivot point;

FIG. **5** is a detailed view of the hinge structure in the closed position;

FIG. **6** is a block diagram of the digital data processing circuitry of the electronic book;

FIG. **7** is a detailed view of a second embodiment of the thumb pad with a place indicator display; and

FIG. **8** is a diagram illustrating presentation of the place indicator display in different states.

DESCRIPTION OF PREFERRED EMBODIMENTS

The drawings illustrate an electronic book that receives digital data containing the contents of various forms of printed publications, which for convenience will be referred to as "books", from a variety of data input sources. The electronic book is powered by an internal power source or by a battery source mounted on a removable mount for ready replacement. Two hinged displays open in the manner of two facing pages and display the contents in the still position for reading and also present effects of turning pages and leafing through pages as controlled by the reader.

The book is held in the manner of a printed book and operated by the thumbs while the book is held with the hands in their common book reading position. Controls are located adjacent to their common book reading position. Controls are located adjacent to rather than on the displays or pages. Information other than the contents of the publication to be read is eliminated from the display representing the page to the extent feasible, so the reader is presented with a replication of the printed page rather than a computer-like display. The manner of controlling the presentation of material, and the visual and textural characteristics of parts, are all selected to contribute to the book-like character of the invention, and present a reader with a reading experience approximating that of reading a printed book.

Electronic book **1** is shown in FIG. **1** as positioned for use by a reader in the reclining position. Simulated facing pages of the book are provided by left display **4** and right display **5** mounted in left housing **2** and right housing **3**, respectively, which are hinged to open in book-like fashion.